



Commonwealth of Massachusetts  
Executive Office of Energy & Environmental Affairs

## Department of Environmental Protection

Central Regional Office • 8 New Bond Street, Worcester MA 01606 • 508-792-7650

Charles D. Baker  
Governor  
  
Karyn E. Polito  
Lieutenant Governor

Matthew A. Beaton  
Secretary  
  
Martin Suuberg  
Commissioner

**BWP SW 36 POST-CLOSURE USE – MAJOR**  
Shirley Landfill, Leominster Road  
Ground Mounted Solar Photovoltaic Facility

Permit Issuance Date: March 20, 2015

Names of Permittees: Town of Shirley (“Town” or “Permittee”)  
7 Keady Way  
Shirley, MA 01464

NextSun Energy, LLC (“Permittee” or “Applicant”)  
77 Pond Avenue, Suite 101  
Brookline, MA 02445

Name of Facility: Shirley Landfill (“Facility” or “Landfill”)  
Facility Address: 160 Leominster Road  
Shirley, Massachusetts 01464

MassDEP Region: Central Regional Office (CERO), Worcester (“MassDEP” or  
“Department”)  
Solid Waste Management Program

Permit Number: X264311 (Transmittal No.)

Facility Number: 172927

MassDEP Classification: CLF

### **I. FACILITY DESCRIPTION AND OUTSTANDING APPROVAL STATUS**

#### **A. Facility**

1. Owner: Town of Shirley  
7 Keady Way  
Shirley, MA 01464

2.     Operator:     NextSun Energy, LLC  
                      77 Pond Avenue, Suite 101  
                      Brookline, MA 02445
  
3.     Description: The Landfill occupies approximately 10.5 acres of site assigned area within a 47 acre parcel of land in Shirley, Massachusetts. The Landfill was capped in two stages and has been closed since November 1999. Phases I & II of the Landfill, which were capped in 1992, encompass approximately 6.3 acres. Phase III of the Landfill, which was capped in 1999, encompasses approximately 4.2 acres.

The proposed solar array, including photovoltaic modules and inter-rack systems, will encompass approximately 3 acres of the Landfill.

**B.     Title of Approved Plans/Permits Affecting Proposed Operation.**

Town of Shirley, MA, Shirley Sanitary Landfill, Partial Closure QA/QC,  
Phases 1 & 2, November 1992  
Prepared by: Weston & Sampson Engineers, Inc., Michael J. Scipione, P.E.  
Received by MassDEP-CERO: November 13, 1992

MassDEP “Shirley Partial Closure of Municipal Sanitary Landfill –  
Leominster Road, Letter of Compliance” Phases 1 & 2  
Issued by MassDEP: March 11, 1996

Town of Shirley, MA, Construction Certification Report, Phase 3 Closure of the  
Shirley Sanitary Landfill, June 2000  
Prepared by: Weston & Sampson Engineers, Inc., Michael J. Scipione, P.E.  
Received by MassDEP-CERO: June 14, 2000

**C.     Permit Application Information for BWP SW 36 Post-Closure Use – Major**

1.     Applicant Name:  
  
          NextSun Energy, LLC  
          77 Pond Avenue, Suite 101  
          Brookline, MA 02445
  
2.     Transmittal Number: X264311 (Permit No.)
  
3.     Start Date of Application: January 13, 2015
  
4.     Consulting Registered Professional Engineer:

TRC Corporation  
650 Suffolk Street  
Lowell, MA 01854  
Contact: Robert Jackson, P.E.  
Tel.: 978-970-5600

5. Title of Plans & Reports, Submission and Date of Receipt at MassDEP-CERO:

BWP SW 36, Post-Closure Use Permit Application “1.9 MW DC Solar Project, Former Shirley Landfill, Shirley, Massachusetts”  
Prepared by: TRC Corporation  
Dated: January 2015  
Received by MassDEP-CERO: January 12, 2015

Supplemental Information:  
Response to Administrative Deficiency Notice, “Town of Shirley Solar Project, BWP SW 36 Application for Post-Closure Use Permit” Transmittal No. X264311”  
Dated: February 11, 2015  
Submitted by: TRC Corporation  
Received by MassDEP-CERO: February 12, 2015

Correspondence dated February 13, 2015 from the Natural Heritage & Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries & Wildlife (“the Division”) indicating as the determination pertains to the Landfill Solar Array Project that the project, as currently proposed, **will not result in a “take”** of state-listed rare species.

6. Project Description:

The post-closure use request is for the installation and operation of a 1.9 Megawatt (DC) rated ground mounted solar photovoltaic (PV) array (“Landfill Array”) on the capped Landfill owned by the Town of Shirley. The solar panels will encompass most of Phases I & II and the crown of Phase III of the capped Landfill. For the purposes of this Permit, the terms “Phases I & II” and “Phases 1 & 2” are used interchangeably, and the terms “Phase III” and “Phase 3” are used interchangeably.

In the Application, the Applicant proposes to construct and maintain the Landfill Array, which will consist of the following components:

- Approximately 4,176 photovoltaic modules on panels supported by mounted racking systems on poured-in-place, concrete-lined ballast blocks underlain by gravel installed above the existing surface of the capped Landfill cover system, and the surface-mounted ballast blocks will not penetrate the Landfill cover system;
- Cable and transmission lines from the panels mounted mostly on the racking systems above grade which will not impact the Landfill cap;
- Two central inverters, to be located on concrete pads on the Phase III toe of slope, and off the Landfill cap, including associated transformer equipment and interconnect equipment to be installed and located off the Landfill cap. No excavation on the Landfill shall exceed twelve (12) inches below grade or be allowed to penetrate the low permeability layer of the Landfill without prior approval as noted in Plan C-4 of the application;
- Conduits between the inverter stations and interconnection points buried no more than twelve (12) inches below grade to meet the National Electric Code for safety and to prevent damage during mowing of the vegetative layer of the Landfill cap. No excavation for the burial of the conduits shall exceed twelve (12) inches below grade or be allowed to penetrate the low permeability layer of the Landfill without prior approval as noted in the application;
- An existing on-Landfill access road along the east side of the Landfill to the northern end, which may need improvement. The construction and location of any temporary roads that may be necessary on the Landfill for the installation of the Landfill Array shall be subject to prior approval as noted in Plan C-4 of the application; and
- A perimeter fence installed along the outside edge of the Landfill cap that will provide site security.

This post-closure use permit authorizes the installation and maintenance of the proposed Landfill Array on the capped Landfill and appurtenances thereto. It does not pertain to or include the installation or operation of a second 600 KW-DC ground mounted solar PV array planned to be constructed off of the footprint of the Landfill on separate Town-owned property located to the east of the Landfill Array.

## **II. POST-CLOSURE USE – MAJOR, APPLICATION REVIEW AND APPROVAL**

The post-closure use application complies with the application requirements set forth at 310 CMR 19.030: Application for a Solid Waste Management Facility Permit and 310 CMR 19.033: Permit Procedure for an Application for a Permit Modification or Other Approval, and was reviewed in accordance with 310 CMR 19.038: Review Criteria for a New or Expanded Facility Permit or Permit Modification, 310 CMR 19.143: Post-closure Use of Landfills, and MassDEP's Landfill Technical Guidance Manual (May 1997). Based on the information presented in the plans and reports referenced in Section I. C. 5. Above and the NHESP correspondence referenced in Section I.C. above, MassDEP approves the Applicant's request for a post-closure use permit at the Facility. This document is a Permit, issued pursuant to M.G.L. c. 111, Section 150A, and 310 CMR 19.000 *et seq.*, the "Solid Waste Management Facility Regulations", and it is subject to the conditions set forth below. In the event this Permit conflicts with all or parts of prior approvals or permits issued pursuant to M.G.L. c. 111, Section 150A, the terms and conditions of this Permit shall supersede the conflicting provisions of the prior permits and/or approvals. This Permit does not convey property rights of any sort or any exclusive privilege.

## **III. GENERAL PERMIT CONDITIONS**

- A. Compliance with Plans** - The Permittees shall conduct operations in accordance with approved plans, reports, and other submissions described in Section I.C. above, except as may be modified by the conditions set forth in Section IV. No material changes in the design or activities described in the approved documents shall be performed without prior written Department approval.
- B. Compliance with Other Laws and Regulations** - The construction, operation, maintenance and closure of this Facility shall be performed in compliance with other applicable local, state and federal laws, regulations, and bylaws.
- C. Standard Conditions** - The Permittees shall maintain the Facility in accordance with the conditions set forth at 310 CMR 19.007-19.011 and 19.043(5).
- D. Joint Liability** - This Permit is issued subject to the conditions of joint liability of the Facility owner and operator in accordance with 310 CMR 19.043(3).
- E. Right of Access** - MassDEP and its agents and employees shall have the right to enter upon the Facility site at all reasonable times and without notice, to inspect the Facility and any equipment, structure or land located thereon, take samples, recover materials or discharges, have access to and copy records, to perform tests and to otherwise monitor compliance with this approval, or any and all permits relative to the operation of the Facility, and all environmental laws and

regulations. This right of entry and inspection shall be in addition to MassDEP's access authorities and rights under applicable federal and state laws and regulations, as well as any permits or other agreements between the Permittee and MassDEP.

- F. Transfer** - No transfer of this permit shall be permitted except in accordance with the requirements of 310 CMR 19.044.
- G. Permit Modification** - The Department reserves the right to rescind, suspend or modify this Permit by the imposition of additional conditions based upon a determination of actual or the threat of adverse impacts from the construction, operation, maintenance or closure of the Facility.
- H. Other MassDEP Permits or Approvals** - In the event this Permit conflicts with all or parts of prior plan approvals or permits issued pursuant to Chapter 111, Section 150A, the terms and conditions of this Permit shall supersede the conflicting provisions of the prior permits and/or approvals. This Permit does not convey property rights of any sort or any exclusive privilege.
- I. Notice of Landfill Operation** – No later than June 30, 2015, the Town of Shirley shall provide MassDEP with written proof that it has recorded in the Middlesex South Registry of Deeds a Notice of Landfill Operation for the Facility, in compliance with 310 CMR 19.141.

#### IV. SPECIFIC PERMIT CONDITIONS

- A. Criteria for Post-Closure Use** - This approval for post-closure use of the Shirley Landfill shall be accomplished such that the Permittees ensure that no activity associated with the Facility, or with the Landfill Array and appurtenances thereto as described in the Application, shall in any way alter the integrity of the Landfill cover system or any of the site environmental monitoring systems located on the site assigned land off of Leominster Road.
- B. Other Post-Closure Use** - The Permittees shall not use the Landfill for any post-closure activity other than that approved by this permit without submittal and Department approval of a Post-Closure Use Permit Application in accordance with 310 CMR 19.143: Post-Closure Use of Landfills.
- C. Inspection and Repair of Settlement Areas** - Prior to constructing the Landfill Array, the Permittees shall survey any suspect settlement areas on the Landfill to determine the lowest spot. The Permittees shall then survey the surrounding area to find the "relief point" defined as the lowest surrounding area where ponded water would flow out. The elevation difference is defined as the "pond value". For purposes of this permit, minor settlement shall be defined as a pond value of

less than 12 inches. Prior to constructing the Landfill Array, the Permittees shall correct any area that has undergone minor settlement by the placement of additional vegetative support soil to promote runoff and shall reseed the area. The Permittees shall survey any area repaired and mark the location on a plan with the pond value. Any future settlement shall be recorded cumulatively.

If/when the total settlement reaches 12 inches the area will be considered to have suffered major settlement and the Permittees must undertake appropriate repairs to eliminate ponding. Any minor settlement repair may be done as routine maintenance, provided that the owner and/or operator reports the settlement to MassDEP and states its intent to perform repairs, and provides MassDEP with final survey (as-built) results and a summary write-up.

Major settlement is defined as a pond value of greater than 12 inches. When this occurs, the Permittees must repair the final cover system subject to MassDEP approval to prevent surface water ponding. The Permittees must submit any proposal to remedy a major settlement repair within a Corrective Action Design (BWP SW 25) permit application since disruption of the final Landfill cover system will take place and repair details must be submitted to and approved by MassDEP.

The Permittees shall provide for continued monitoring for potential differential settlement due to the Landfill Array during Facility operations along with established provisions for addressing and adjusting for such settlement within the Landfill cover system and/or the Landfill Array system.

- D. Phase III Closure Documentation and Construction** – In June 2000, on behalf of the Town of Shirley, Weston & Sampson submitted to MassDEP a Construction Certification Report for the Phase 3 Closure of the Shirley Sanitary Landfill (“Phase 3 Construction Certification Report”). MassDEP has not yet certified Phase 3 of the Landfill as closed. Additional data regarding the construction of the Phase 3 portion of the Landfill cap is needed before MassDEP can issue a closure certification for Phase 3 of the Landfill. To provide MassDEP with the required data, within 30 days of the Permit issuance date, the Applicant shall submit to MassDEP for review and approval a test pitting work plan for the Phase III section of the Landfill. The work plan shall provide a suitable test pitting program for the Phase III section to confirm that the Phase III Landfill cap was constructed in conformance with the criteria established in the Phase 3 Construction Certification Report. The Applicant shall submit to MassDEP the results of the test pitting program so that MassDEP can assess the “as built” condition of Phase III and determine whether it is appropriate to issue a closure certification of the Phase III section of the Landfill.

- E. Additional Inspections and Monitoring** - During the first year of operation of the Landfill Array, the Permittees shall perform inspections of the Landfill and the Landfill cover system beneath the solar array on a monthly basis and also following major storm events. After the first year of the Landfill Array's operation, these additional inspections may be incorporated into the existing Landfill inspection and monitoring program subject to MassDEP approval. In accordance with 310 CMR 19.018 and 310 CMR 19.142(6), the inspections shall be performed by a Third-Party Inspector who is registered with the Department. The Permittees shall ensure that the inspection reports are submitted to MassDEP-CERO within fourteen (14) days of the inspection.
- F. Vehicles Operating on the Landfill Final Cover System** - Vehicles operating on the Landfill final cover system shall only operate on the existing gravel access drive, except for low ground pressure construction equipment in accordance with the conditions of this permit. Low-pressure construction equipment operating off the existing gravel access drive shall limit turning on the vegetative support layer as much as possible. If MassDEP determines that the use of excavation equipment is creating the potential for damage to the Landfill's liner system, the usage of such equipment shall immediately cease upon notification by MassDEP. All operators of the vehicles entering the final cover system area shall be clearly instructed by the on-site engineer regarding the requirements of this permit prior to arrival, to avoid damage to the Landfill final cover system components. A list of low ground pressure equipment used and the pressure rating of each vehicle shall be included in the certification report required by Specific Permit Condition IV.L.
- G. Permanent and Temporary Roads and Low Ground Pressure Equipment** - The Permittees shall ensure that low ground pressure equipment shall not access the Landfill final cover system from permanent and temporary roads where the transition will result in excessive pressure and wear on the Landfill vegetative service. The on-site engineer may construct ramps as necessary to accommodate the low ground pressure equipment.
- H. Integrity of the Final Cover System** - The Permittees shall limit all disturbances of the Landfill to the proposed installations on top of the vegetative cover of the capped Landfill that are described in the Application. No significant excavations or other penetrations shall be performed into the final cover system during construction or during operation and maintenance of the Landfill Array without prior MassDEP approval. The Permittees shall ensure that vehicles operating on the Landfill do not damage or compromise the Landfill final cover system integrity and that there are no penetrations of any kind of the Landfill final cover system.
- I. Construction Precautions** -



1. The Permittees shall take all necessary precautions to ensure that the proposed construction and maintenance work associated with the Landfill Array does not damage the environmental monitoring network at the Landfill. Prior to the commencement of construction activities, the Permittees shall ensure that environmental monitoring locations are flagged for visibility and protective barriers are placed around such structures, as needed, to prevent damage by vehicles accessing the area. If any damage occurs to the environmental monitoring network components, the Permittees or their contractor(s) shall notify James McQuade, Section Chief, MassDEP-CERO at 508 767-2759 within 24 hours and provide a written plan for repairs, including a schedule.
  2. The Permittees shall take all necessary precautions to protect the Landfill storm water control system, including but not limited to swales, structures, and any and all conveyance systems. If any damage occurs to the storm water control system, the Permittees or their contractor(s) shall notify James McQuade, Section Chief, MassDEP-CERO at 508 767-2759 within 24 hours and provide a written plan for repairs, including a schedule.
  3. This Permit requires that any inverter/ transformer pad or appurtenances must be designed so as not to create a potential fire safety hazard. Potential design features may include but are not limited to the installation of fully sealed conduits, explosion proof connections, and fittings. The Permittees shall also ensure that utility trenches are designed so they do not act as a conduit for landfill gas migration.
  4. All excavations and construction shall be supervised by a Massachusetts Registered Professional Engineer. The Permittees shall report any erosion problems, settlement problems, security or other issues observed at the Landfill to James McQuade, Section Chief, MassDEP-CERO at 508 767-2759 and repair them immediately.
- J. Array Setbacks:** The Permittees shall maintain a minimum ten (10) foot radius buffer between the closest edge of the Landfill Array and all landfill gas vents and stormwater drains.
- K. Notification of Construction** - The Applicant shall notify MassDEP in writing when the post-closure use construction authorized by this permit commences and is completed.
- L. Certification Report** - Within ninety (90) days of completing the installation of the Landfill Array, the Permittees shall provide MassDEP with a certification report. All construction work shall be completed under the supervision of a Massachusetts Registered Professional Engineer who shall have sufficient staff on-site to provide quality assurance/quality control (QA/QC) oversight for all construction work associated with the project. The certification report shall be signed and stamped by

a Massachusetts Registered Professional Engineer and include, at a minimum, written certification from the supervising engineer that the project was performed in accordance with MassDEP regulations, applicable requirements and this Permit. The certification report shall include as-built drawings depicting all pertinent site features and the extent of the Facility, Landfill Array and appurtenances thereto.

- M. Personnel Training** - The Permittees and their contractor(s) shall instruct all Landfill Array construction and maintenance personnel regarding the potential hazards associated with landfill gas and shall instruct or give on-the-job training to all personnel involved in any activity authorized by this Permit. Such instruction or on-the-job training shall teach personnel how to comply with the conditions of this Permit to carry out the authorized activity in a manner that is not hazardous to public health, safety, welfare or the environment. Training shall be provided to workers conducting monitoring and maintenance activities for the Landfill regarding potential hazards associated with the Landfill Array, including but not limited to electrical hazards.
- N. Health and Safety** - The Permittees and their contractor(s) are responsible for ensuring that all necessary precautions are taken to protect the health and safety of workers and the general public during construction, operation, and maintenance of the Landfill Array.
- O. Proposed Inverter/Transformer Pad and Interconnection Equipment** - The Permittees shall ensure that a copy of the final design for the transformer pad and any other electrical and protective switchgear (interconnection equipment) for the Landfill Array project is submitted to MassDEP for its files within 15 days of construction. The Permittees and their contractor(s) are responsible to ensure that utilities/structures will not accumulate landfill gas during construction and operation of the Landfill Array.
- P. Electrical Design Plans** - The Permittees shall submit electrical design plans stamped by a Registered Massachusetts Electrical Engineer to MassDEP for its files within 15 days of construction. The electrical design, including the grounding design, shall meet applicable National Electrical Code (NEC) and local electrical code requirements including but not limited to Article 690 – “Solar Photovoltaic (PV) Systems” of the NEC (2011 Edition). If any grounding rods are installed as part of the grounding system, the rods shall not be driven through the Landfill final cover system.
- Q. Landfill Gas Notification Requirements** -

  - 1. As specified in solid waste management regulations at 310 CMR 19.132 (5) (g): Gas Monitoring,

When, at any time, the concentration of explosive gases exceeds 10% of the lower explosive limit (LEL) in any building, structure, or underground utility conduit at the Facility, excluding gas control, gas recovery and leachate collection system components, the Permittees shall:

- a) take immediate action to protect human health and safety;
- b) notify the Department's Solid Waste Section Chief, James McQuade at 508 767-2759 within two hours of the finding; and
- c) undertake the actions specified under 310 CMR 19.150: Landfill Assessment Requirements and 310 CMR 19.151: Corrective Action Requirements as required by the Department.

2. Pursuant to 310 CMR 40.0321(1)(a), if at any time, monitoring detects the presence of any combustible gases at or in excess of 10% of the LEL at any location within a building or within any utility conduits at the Facility, the owner/operator shall notify the local fire department and MassDEP's Bureau of Waste Site Cleanup-Emergency Response Section at 888-304-1133 within two (2) hours of the exceedance.

- R. Post-Closure Environmental Monitoring** - The Permittees shall maintain the existing and/or any future environmental control or monitoring systems in accordance with 310 CMR 19.133: Maintenance of Environmental Control and Monitoring Systems.
- S. Site Security** - The Permittees are required to provide sufficient fences or other barriers to prevent unauthorized access to the Landfill. The owner/operator must continually monitor and evaluate the potential for unauthorized access to the Landfill and institute all appropriate measures to prevent unauthorized access during the post-closure period.
- T. Decommissioning Plan** - If the proposed Landfill Array project is abandoned, during or after completion of construction, the Applicant shall submit to MassDEP for review and prior approval a detailed decommissioning and site restoration plan, which includes, at a minimum: dismantling and removal of all panels and supporting equipment, transformers, overhead cables, foundations and buildings; and restoration of the roads to restore the Landfill to substantially the same physical condition that existed prior to post-closure use construction.
- U. Other Requirements** - The Permittees and their contractor(s) are responsible to ensure that the proposed work complies with all applicable local, state and federal codes, requirements, regulations and permits.

## **V. RIGHT OF APPEAL**

### **A. Review of Decision**

An applicant aggrieved by the Department's permit decision, within 21 days of the issuance of the Department's permit decision to the applicant, may file a written request, with the appropriate regional office of the Department, that the permit decision be deemed a provisional decision, and a written statement of the basis on which the applicant believes it is aggrieved, together with any supporting materials. Upon timely filing of such a request, the permit decision shall be deemed a provisional decision. Such a request shall reopen the administrative record, and the Department shall issue a final permit decision after the end of the comment period. **Failure by an applicant to exercise the right provided in 310 CMR 19.033(4)(b) shall constitute a waiver of the applicant's right to appeal.**

### **B. Right to Appeal**

Any person aggrieved by the final permit decision, except as provided for under 310 CMR 19.033(4)(b), may file an appeal for judicial review of said permit decision in accordance with the provisions of M.G.L. c. 111, § 150A and M.G.L. c. 30A no later than thirty (30) days following the date of issuance of the final permit decision to the applicant. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the final permit decision by a court of competent jurisdiction, the final permit decision shall be effective in accordance with 310 CMR 19.033(3).

### **C. Notice of Appeal**

Any aggrieved person intending to appeal a final permit decision to the Superior Court shall first provide notice of intention to commence such action. Said notices of intention shall include the Department file number (Transmittal No. X264311) and shall identify with particularity the issues and reason why it is believed the final permit decision was not proper. Such notice shall be provided to the Office of General Counsel of MassDEP and the Regional Director for the regional office which processed the permit application at least five (5) days prior to the filing of an appeal:

Office of General Counsel  
Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

and

Lee Dillard Adams, Regional Director  
Department of Environmental Protection  
8 New Bond Street  
Worcester, MA 01606

No allegation shall be made in any judicial appeal of a final permit decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in 310 CMR 19.000, provided that a matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the environmental impact of the permitted activity.

---

James A. McQuade  
Section Chief  
Solid Waste Management Program